

What are bacteria

Bacterial Infections

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What are Bacteria?

Bacteria are among the smallest living things. A single bacterium consists of just one cell, and is called a single-celled, or unicellular organism.

Even though it is just a single cell, it can carry out all seven life processes (movement, respiration, sensitivity, growth, reproduction, excretion and nutrition).

What's in a bacterium?

There are similarities between plant and animal cells and a bacterium. They all share a cell membrane and cytoplasm. Bacterium also have a cell wall around them, like plant cells. However, unlike most plant and animal cells, it has no nucleus. Instead, it has a circular strand of DNA, called a plasmid, that floats in the cytoplasm.

There are millions of different types of bacteria. Different types of bacteria have different shapes.

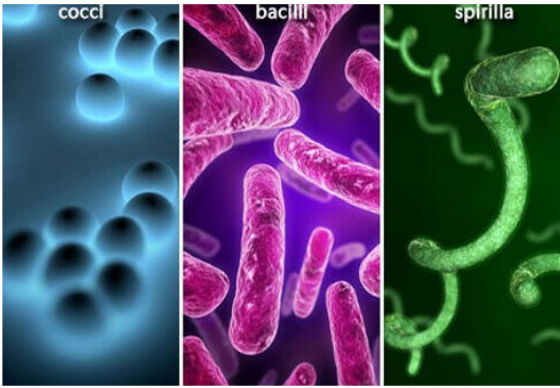
Many types of bacteria have extra cell structures to help them to survive. For example, they may have:

- Flagella, which are tail-like structures that allow bacteria to move through liquids.
- A slime capsule, outside the cell wall, to protect them and stop the bacterium drying out.

Bacteria are microscopic, single-cell organisms that live almost everywhere. Bacteria live in every climate and location on earth. Some are airborne while others live in water or soil. Bacteria live on and inside plants, animals, and people. The word "bacteria" has a negative connotation, but bacteria actually perform many vital functions for organisms and in the environment. For example, plants need bacteria in the soil in order to grow.

The vast majority of bacteria are harmless to people and some strains are even beneficial. In the human gastrointestinal tract, good bacteria aid in digestion and produce vitamins. They also help with immunity, making the body less hospitable to bad bacteria and other harmful pathogens. When considering all the strains of bacteria that exist, relatively few are capable of making people sick.

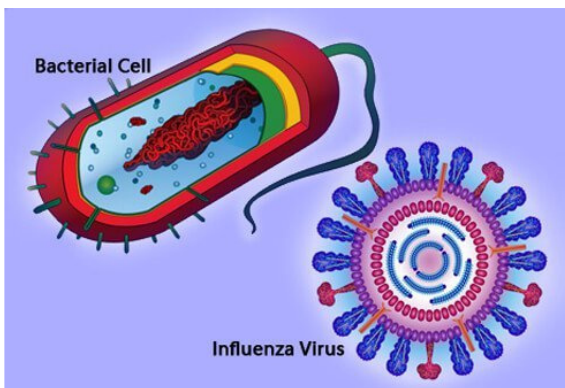
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What Is a Bacterial Infection?

A bacterial infection is a proliferation of a harmful strain of bacteria on or inside the body. Bacteria can infect any area of the body. Pneumonia, meningitis, and food poisoning are just a few illnesses that may be caused by harmful bacteria. Bacteria come in three basic shapes: rod-shaped (bacilli), spherical (cocci), or helical (spirilla). Bacteria may also be classified as gram-positive or gram-negative. Gram-positive bacteria have a thick cell wall while gram-negative bacteria do not. Gram staining, bacterial culture with antibiotic sensitivity determination, and other tests like genetic analysis are used to identify bacterial strains and help determine the appropriate course of treatment.



Bacteria vs. Virus

Bacteria and viruses are different types of pathogens, organisms that can cause disease. Bacteria are larger than viruses and are capable of reproducing on their own. Viruses are much smaller than bacteria and cannot reproduce on their own. Instead, viruses reproduce by infecting a host and using the host's DNA repair and replication systems to make copies of itself.

The symptoms of a bacterial or viral infection depend on the area of the body that is affected. Sometimes the symptoms of the two can be very similar. For example, runny nose, cough, headache, and fatigue can occur with the common cold (virus) and with a sinus infection (bacteria). A doctor may use the presence of other symptoms (such as fever or body aches), the length of the illness, and certain lab tests to determine if an illness is due to a virus, bacteria, or some other pathogen or disease process.

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Foodborne Bacterial Infections

Bacterial infections are one cause of foodborne illness. Nausea, vomiting, diarrhea, fever, chills, and abdominal pain are common symptoms of food poisoning. Raw meat, fish, eggs, poultry, and unpasteurized dairy products may harbor harmful bacteria that can cause illness. Unsanitary food preparation and handling can also encourage bacterial growth. Bacteria that cause food poisoning include:

- ***Campylobacter jejuni* (C. jejuni)** is a diarrheal illness often accompanied by cramps and fever.
- ***Clostridium botulinum* (C. botulinum)** is a potentially life-threatening bacterium that produces powerful neurotoxins.
- ***Escherichia coli* (E. coli) O157:H7** is a diarrheal (often bloody) illness that may be accompanied by nausea, vomiting, fever, and abdominal cramps.
- ***Listeria monocytogenes* (L. monocytogenes)** causes fever, muscle aches, and diarrhea. Pregnant women, elderly individuals, infants, and those with weakened immune systems are most at risk for acquiring this infection.
- ***Salmonella*** causes fever, diarrhea, and abdominal cramps. Symptoms typically last between 4 and 7 days.
- ***Vibrio*** causes diarrhea when ingested, but it can also cause severe skin infections when it comes in contact with an open wound.

[...]



Antibiotics

Antibiotics are medications that fight bacterial infections. They work by disrupting the processes necessary for bacterial cell growth and proliferation. It's important to take antibiotics exactly as prescribed. Failure to do so could make a bacterial infection worse.

https://www.onhealth.com/content/1/bacterial_infections

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Antibiotics don't treat viruses, but they're sometimes prescribed in viral illnesses to help prevent a "secondary bacterial infection." Secondary infections occur when someone is in a weakened or compromised state due to an existing illness.



Source: CDC Antibiotic Resistance Threats in the United States, 2011

Antibiotic Resistance

Overuse and misuse of antibiotics has led to a rise in antibiotic resistance. Antibiotic resistance occurs when bacteria are no longer sensitive to a medication that should eliminate an infection. Antibiotic-resistant bacterial infections are potentially very dangerous and increase the risk of death. About 2 million people in the U.S. suffer from antibiotic resistant infections each year and 23,000 die due to the condition. The CDC estimates 14,000 deaths alone are due to *Clostridium difficile* (*C. difficile*) infections that occur because of antibiotic suppression of other bacteria allow *C. difficile* to proliferate. Most deaths due to antibiotic resistant infections occur in hospitalized patients and those who are in nursing homes.